

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in view of the present amendments and in light of the following discussion, is respectfully requested.

Claims 1 and 3-9 are pending. Claims 1, 3, 5 and 7 are amended. No new matter is introduced.

In the outstanding Office Action, Claims 1 and 3-9 were rejected under 35 U.S.C. § 112, first paragraph; Claims 1 and 3-9 were also rejected under 35 U.S.C. § 112, second paragraph; and Claims 1 and 3-9 were rejected under 35 U.S.C. § 101.

In reply, amended Claim 1 is directed to a quantum circuit and recites means plus function language, invoking 35 U.S.C. § 112, paragraph six. “Accordingly, the PTO may not disregard the structure disclosed in the specification corresponding to such language when rendering a patentability determination.” MPEP § 2181.

Further, amended Claim 5 is amended to recite a quantum computer including a quantum circuit comprising:

a first section, *including a polarization beam splitter*, configured to represent a quantum bit by at least one polarization direction of light and provide an output;
a second section, *responsive to the output of the first section*, configured to sequentially supply a sequence of polarized light pulses representing a quantum bit string to a third section, the third section being configured to determine an amount of polarization rotation and a phase difference applied to a certain light pulse on the basis of a polarization measurement, by at least *two detectors*, of a preceding input light pulse sequence, realizing a controlled-unitary transform configured to cause a phase difference between a polarization indicating a $|0\rangle$ state and a polarization indicating a $|1\rangle$ state. (Emphasis Added.)

The outstanding Office Action rejected Claims 1 and 3-9 under 35 U.S.C. § 112, first paragraph, for failing to comply with the written description requirement. Specifically, the outstanding Office Action notes that “with respect to Claims 1 and 5, there is no reference to

the ‘first section’, ‘second section’ and ‘third section’ in the specification or drawings and there is no structure in the claim to define these sections.”¹

MPEP § 2163.04 states that the written description requirement of 35 U.S.C. § 112, first paragraph, is met unless one of ordinary skill in the art would not recognize in an applicants disclosure a description of the invention defined by the claims. Thus, it is not necessary or required that the claims use the exact language of the specification as long as one of ordinary skill in the art would recognize the claimed advancement as being described in the specification.

Figure 2 describes a circuit of an exemplary embodiment, and is discussed on pages 9-11 of the specification. One of skill in the art would recognize the sections of at least this circuit as corresponding to the claim language. Therefore, it is submitted amended Claims 1 and 5, and their corresponding dependent claims, comply with the requirements of 35 U.S.C. § 112, first paragraph, and it is therefore respectfully requested that the rejection of amended Claims 1 and 3-9 under 35 U.S.C. § 112, first paragraph be withdrawn.

Moreover, the rejection of Claims 1 and 3-9 under 35 U.S.C. § 112, second paragraph, is addressed by the amendments to Claims 1 and 5 discussed above. Accordingly it is respectfully requested that the rejection of Claims 1 and 3-9 under 35 U.S.C. § 112, second paragraph be withdrawn.

Regarding the rejection of Claims 1 and 3-9 under 35 U.S.C. § 101, as discussed above amended Claim 1 recites means plus function language, and corresponding structures can be found at least in Figure 2. Amended Claim 5 recites a quantum circuit including such structural features as a polarization beam splitter and at least two detectors. The Office notes that the invention is directed to an abstract idea because the claims require no physical structures and polarized light, without more, is a natural phenomenon.² Applicants, however,

¹ See the outstanding Office Action at page 3, item 7.

² See the outstanding Office Action at pages 4-5, Item 10.

do not claim polarized light, but instead a quantum circuit including the corresponding circuit structure as claimed. Therefore, it is submitted that amended Claims 1 and 5, together with their corresponding dependent claims, conforms with the requirements of 35 U.S.C. § 101, and it is respectfully requested that the rejection of Claims 1 and 3-9 under 35 U.S.C. § 101 be withdrawn.

For the reasons discussed above, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. Therefore, a Notice of Allowance for Claims 1 and 3-9 is earnestly solicited.

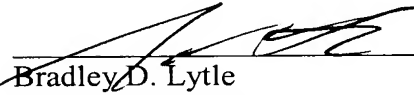
Respectfully submitted,

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